

## **Consulting contract No. 114725 Report**

**Consultant: Watu Wamae**

**Contract title: Support for Research and Communication Capacity Building of the Project Team “Traditional science, technology and innovation systems in the context of modern incubator research development agency”.**

Aim: To provide mentoring and coaching to improve the articulation of the research findings and linkages within the innovation system.

Terms of reference:

- Think through the conceptual framework and strengthen it from an innovation systems perspective
- Better articulate the findings, linkages and potential entry points for linking the informal sector with the formal sector
- Help the team with ideas for sustaining the effort beyond the project term. We may be able to integrate a next phase into our future program but I am not quite certain about it now. Much depends on how the final stage is shaped, articulated and presented
- Advise about publishing and communicating with the right audiences

This consultancy took place from 2<sup>nd</sup> to 11<sup>th</sup> November 2011 at the Ugandan Industrial Research Institute (UIRI). It involved 4 people: Deborah Wendiro (Principal Investigator) and three named researcher - Christine Mwanja, Margaret Dhabangi, Janeffer Mayambala<sup>1</sup>

### **Approach to mentorship and coaching**

Prior to my arrival in Uganda I reviewed the draft report presented to IDRC and engaged with the PI Deborah Wendiro by email. The aim was to:

- a) Identify the nature and extent of the key areas for support based on the review of the report
- b) Obtain a better understanding of the PI's research background to better target mentorship and coaching
- c) Develop a shared understanding of the problem areas of the report on which to focus the mentoring and coaching

On a) after having reviewed the draft report presented to IDRC, it was clear that the research had sought to address useful issues with a strong potential for impact, a critical element for funding research. This had, however, been compromised by a series of problems some of which were of a basic nature such as structuring a report. There were fundamental limitations around core elements:

- scoping of the study
- problem statement
- research strategy or approach (conceptual framework)
- research design (methodology and research methods)
- analysis (there was clearly no meaningful discussion of results)

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<sup>1</sup> Janeffer Mayambala did not participate in all session due to family related concern, but measure were put in place to ensure rapid “catch-up”

It quickly became clear that the team had limited training in core research aspect for effective research, articulation and delivery of an impactful report. This prompted the request for b)

Concerning b) a CV was promptly provided, which was key in allowing me to understand the PI background and develop a targeted approach towards mentorship and coaching. The PI and as it came to light later on, the rest of the team were all coming from backgrounds in natural sciences. They had grounded understanding of the science behind the issues they explored and hence the sharpness of the potential impact. However, the disjointed manner in which the findings were presented and in particular the inability to relate them to social outcomes meant setting things right required fundamental training.

The preferred approach was to lay the ground by developing a shared understanding of problem area with the PI – point c). One of the questions put to the PI time and again before departure for Uganda was along the following lines: “As requested in a previous email, it would be important for you to indicate areas where you think you require most help with your report to allow me to do any preparative work so that time is not lost on the ground.” This remained unanswered despite numerous requests and eventually, when a response was provided, it was clear that this was a task that could only be effectively achieved in a face to face engagement. It was clear that the PI’s understanding was that the report was “done and dusted” and that my visit was about the next steps as illustrated in the response below (see Annex 4).

The implication for this was that c) without which meaningful progress on the stated TORs could be made was yet to be achieved. The preliminary assessment nevertheless provided useful elements on how to approach the mentorship and structure the coaching.

## Structure of the mentorship and coaching

**Day 0:** Travel to Uganda

**Day 1:** Introduction to the project team, to the institution (UIRI) and a 1-2-1 session with the PI

### *Objective:*

Understand the work environment and in particular possible external constraints/unjustifiable institutional pressures impacting on the project. It also provided a better understanding of the background of all researchers involved in the project, the specific case studies and possible gaps that may have made it difficult to articulate the report adequately. They all had a natural sciences background making a social study approach required in understanding the social aspects of the research a significant challenge. The stated aim of the research was “To examine gender from a wider perspective of innovation systems in developing countries”.

### *Observations:*

To effectively achieve the stated aim, at least one of the two would have been necessary:

- A multidisciplinary team involving at least one social scientist
- Continued mentorship throughout the projects to ensure that the social aspects of the research were well understood within the context of the research and effectively articulated in the report

There were myriad of institutional bottlenecks that threatened the effective execution and smooth running of the project. Such threats continued to be manifest during my stay and threatened to interfere with the coaching and mentorship as per the TORs.

**Day 2:** Assessment of problem areas, determination of issues to be addressed and drawing up of a plan for action

*Objective:*

Provide the PI with an opportunity to discuss her experience with the project and raise any particular challenges encountered. This was key in establishing a clear understanding of TORs and developing a shared understanding of the problem areas of the report.

*Observations:*

Untold effort had been single-handedly put into the research despite the weaknesses mentioned in the previous section. The PI is particularly self-driven with a clear understanding of the need to deepen and extend capabilities. She not only recruited extremely talented researchers, but also set them up on Masters degree courses focused on the case studies of the project. While the PI had right up to this stage thought that the report was fine she very quickly understood without much prompting why the TORs were defined as they were and the implications for the report. In summary, behind this, there is considerable intensity of motivation on the part of the team and it is largely inspired by the PI. One of the named researchers for example through the encouragement of the PI had applied and successfully obtained an AWARD fellowship, a prestigious Bill and Melinda Gates sponsored “professional development program that strengthens the research and leadership skills of African women in agricultural science, empowering them to contribute more effectively to poverty alleviation and food security in sub-Saharan Africa.” The PI is also an AWARD fellow.

**Day 3 and 4:** Based on the successful accomplishment of day 1 and 2 above the weekend days and 3 and 4 were split into two:

- a) providing detailed comments on the report that would facilitate a section by section feedback but more importantly that would lead to a clear understanding for the need for a total overhaul of the report and how to go about “pitching” it in way that provides credibility and adequately highlights the importance of the findings.
- b) designing course material on the following:
  - a. Lecture 1: Introduction to Innovation Systems - definitions, concepts, approach
  - b. Lecture 2: Innovation systems approach in the African context
  - c. Lecture 3: Changing innovation dynamics and relevance to the African context
  - d. Lecture 4: Methodological approach to innovation systems research
  - e. Lecture 5: General skills on report writing
  - f. Seminar 1: Key research principles – Action Research
  - g. Seminar 2: Framing of research problems
  - h. Preparing Problem Based Learning material

*Objectives:*

- After having assessed the nature of the problem and developed a shared understanding of problem areas with the PI, responding to the requirement on “a conceptual framework for the report” (it had none) and “strengthening report from an innovation systems perspective”, ultimately meant taking a step back and attempting to provide in a few days time two courses that would normally be delivered over an entire semester: (i) a course on the innovation systems approach - the team did not have any basic knowledge of this approach and, (ii) a course on research, strategy, design and method. Responding to the requirement “Better articulate the findings, linkages and potential entry points for linking the informal sector with the formal sector”, relied heavily on these two courses. The agenda for the duration of the mentorship and coaching is presented in Annex 1.

*Observations:*

This heavily charged agenda and perhaps over ambitious one was prompted by the enthusiasm of the team. The days were very tight and the team took home huge amount of homework to be done under the light of a candle and completed in the early mornings at the UIRI offices where they would generally arrive at 5am from far flung areas outside the city.

**Day 5:** The lectures on the innovation systems perspective aimed to provide an understanding of the relationship between innovation and development based on the evolutionary approach. They were complemented by suggested readings and student activities based on the Problem Based Learning approach to facilitate the integration of concepts.

*Objectives:*

The lectures aimed to:

- Provide a review of terms and concepts that are central to the notion of innovation
- Address some conceptual issues related to innovation and its role in social change and economic performance
- Discuss the systemic nature of innovation and outline the 'systems perspective'
- Discuss the process through which innovation occurs (interactive learning process)
- Underline the role of policy in innovation and development

*Observations:*

Delivering such a huge amount of information based a previously unknown approach was risky and could have proved ineffective. However, the sheer will of the team was the main driver of the depth and extent of lectures. They had an extreme sense of urgency to make the most of this opportunity and take in as much as possible. It quickly became evident that the risk was rather that they could have easily become insatiable if sufficient depth and breadth was not provided.

**Day 6:** The lectures on research, strategy, design and method were supported through direct application to the relevant sections of the project work, which would then directly feed into the report. Emphasis was placed on the four case studies. Each member of the team redesigned and presented the case study they were responsible for based on what they had drawn from both the lectures on (i) the innovation systems approach and, (ii) the research, strategy, design and method.

*Objectives:*

The main aim was to learn and directly apply the acquired skills in real time. This not only provided a useful opportunity to integrate concepts and approaches, but directly contributed to developing the report. In particular, there was an opportunity to focus on the case studies, which provide a major contribution in this research project. The presentations also targeted the improvement of presentation and communication skills.

*Observations:*

As in day 5 the team's relentless enthusiasm to make the most of this opportunity meant that it readily responded with much improved case study presentations.

**Day 7:** The day was focused on getting the report right, articulating the findings, linkages and potential entry points for linking the informal sector with the formal sector etc.

*Objectives*

The main aim was to get the structure of the report right, develop a conceptual framework for the research based on an innovation systems approach, and clearly lay out the research method used in the project. Annex 2 provides detailed notes on the rationale for the report structure and the

purpose of each chapter (see for example the “Introduction” section in Annex 2). A great amount of hand holding was necessary if this was not to set off on a fairly disastrous course. For example, it involved reworking the impossible and complex and fuzzy research questions that were not clearly located in terms of contributions to literature and very “thin” or totally absent logical connects from there through the aspects of research design and analysis of findings. This process was also key in clearly outlining identified gaps for example in the literature review or information collected on the case studies and to establish strategies for addressing the gaps. A final aim was to develop a template for case study analysis and write-up (see Annex 3).

*Observations:*

Given the intensity with which learning had to take place, it seemed critical to revisit some of the key concepts and in particular research principles. As pointed out earlier the team has a natural science background and the difficulty of employing social science methods could not be under-estimated given the stark differences in the two fields. A useful way to go about this was to invite a guest lecture to do a seminar on “Key research principles – Action Research”. This not only provided the team with an opportunity to revisit issues previously addressed but also to network with a Makerere university lecture and also previous beneficiary of an IDRC grant with social science skills and previously unknown to the team.

**Day 8:** The day focused on three elements: (i) general skills on report writing and on journal article (how to publish and why it is important), (ii) future prospects including conferences, research networks, publications, proposal writing, research grant opportunities, (iii) analysis and write-up of case studies and, (iv) presentation of research in a way that communicates key points effectively.

*Objective:*

To present case studies based on rigour and demonstrating critical analysis. Each team member presented their case study, which was redesigned based on the acquired skills and written up based on the template developed the previous day. This provided the team with an opportunity to make comparisons with the first case studies presentations and note the differences for themselves.

*Observation:*

By this point minimal intervention was required and the team was very keen to take a lead on the activities of the day as appropriate. The opportunity to develop the link with the guest lecturer was very much appreciated. We mutually agreed to provide a second opportunity for the guest lecturer to further elaborate on the previous days seminar and specifically on the question of “framing a research problem”. The guest lecturer also offered to attend the case study presentations and provide feedback. This undoubtedly provided stronger feedback as it meant a panel of two rather than one.

**Day 9:** The last day was structured around two activities: (i) 1-2-1 sessions with each of the researchers and (ii) an open discussion.

*Objective:*

Thus far the 1-2-1 sessions had been limited to the PI. This last day extended the 1-2-1 sessions to rest of the researchers. The primary aim of these sessions was to provide an opportunity to confidentially highlight issues encountered in the project, discuss future aspirations, and understand possible areas for attention in similar IDRC projects.

The open discussion provided an opportunity to revisit any areas that may have required further clarification or discussion, and to wrap up this coaching and mentoring opportunity.

## General observations

The opportunity to provide mentoring and coaching to this project and other similar projects lead me to the following observations:

- (i) There is a lot of African human capital locked up in individuals holding IDRC (ITS/IID) grants who on their own are unlikely to develop their full potential and may well run into considerable personal difficulties. Individuals may be extremely self driven but often come with little background knowledge on key aspects of STI research and face formidable difficulties in trying to bring themselves up to speed often on no more than the IDRC library resource service. This mentorship/coaching demonstrated that researchers tend to put in double the effort required to produce a decent piece of research but usually fall short because of lack of opportunities to acquire skills relevant to the project. For example, the team unanimously pointed out that the methodology courses previously attended in local institutions provided them with no applicable skills and bore no resemblance to the one delivered in this coaching opportunity.
- (ii) In the African context, STI research (an policy) is not well embedded and in most countries course work on these topics is not available. Furthermore, building a critical mass necessarily implies involving researcher with no higher than a Masters degree and very often researchers currently pursuing or hoping to pursue a Masters degree. This suggest that the bulk of them will not have had the opportunity to attend course work or other training on core aspects of methodology, which are often taught at the post-graduate level and in some cases the training in the local institutions may be inadequate.

## Specific observations

With regard to the Project Team “Traditional science, technology and innovation systems in the context of modern incubator research development agency”, three observations are in order:

- The team is extremely motivated and self driven, with a long view on important issues relating to social inclusion – it would be useful to nurture all the four researchers and specific ideas could be provided on this point should this be seen as necessary
- The team faces a strongly unfavourable institutional context where huge amounts or time a lost jumping hoops to get a minimal amount of work done
- The team is highly isolated in terms of research networks or fora to share ideas on their research

Despite the identified limitations, the potential for impact of the research, which I would consider a critical element for funding research, was clearly embedded in their work although in a fairly disjointed manner.

## Other observations

- IDRC clearly has a useful strategy for identifying researchers with strong potential and in particular who are self driven.
- Mechanisms for unlocking that potential could be strengthened through a number of cost effective mechanisms

Bearing in mind the contextual challenges in the African context and perhaps in other developing regions it may be useful to consider systematically integrating in to the grant award package the following:

- A methodology workshop at the start of projects and where necessary clarification of research questions and/or STI concepts

- At the interim report stage, iron out issues that may have headed off along disastrous lines. For example, coaching and mentoring at this point is more likely to add greater value including on “softer” aspects such as confidence building.
- It may be useful to consider the positive effects of a role model/mentor. Most of the research are not globally exposed and could experience crippling isolation. A role model/mentor could offer forms of mentorships around confidence building, soft skills, presentation skills, communication skills, facilitate joining networks etc and perhaps provide continuity after the project end through for example alumni groups.

### **Some thoughts**

It would be useful to consider devising a “non-conventional” approach to the underlying problem at hand, which I have encountered in similar activities and which in my view is endemic and will continue to occur in future projects. The situation presented by this case is illustrative of an underlying problem that would require proper consideration. The observations made above are not unique to this project. The researchers typically constitute the category that needs to be mined in order to expand the skills base in innovation research in Africa. One route that IDRC may wish to explore in its efforts to build research capacity in Africa may be to develop a model (physical or virtual) for systematically delivering mentorship and coaching on fundamental areas of STI research including on the innovation systems approach and on research, strategy, design and method. I am convinced that such an effort would yield remarkable results not only in capacity development, but also in STI research that can usefully contribute to policymaking.

## **Annex 1**

### **IDRC – ITS Project on “Gender and Innovation: understanding their mutual influence and impacts”**

Aim: To examine gender from a wider perspective of innovation systems in developing countries

Ugandan Industrial Research Institute (UIRI) Project: “Traditional science, technology and innovation systems in the context of modern incubator research development agency”

Principal Investigator: Deborah Wendiro

Named researchers: Christine Mwanja, Margaret Dhabangi, Janeffer Mayambala

### **Meeting of research team with Watu Wamae: 2 - 11 November 2011 at the Ugandan Industrial Research Institute (UIRI)**

#### **Agenda**

#### **November 3, 2011**

Introductions - UIRI and the research team

1-2-1 Watu and Deborah

#### **November 4, 2011**

Assessment of problem areas, determination of issues to be address and drawing up a plan for action (Deborah and Watu)

#### **November 5-6, 2011**

Detailed review of draft report and preparation of lectures (Watu)

#### **November 7, 2011**

09:00 Opening and stage setting

09:30 Lecture: Introduction to Innovation Systems - definitions, concepts, approach (Watu)

10:30 Lecture: Innovation systems approach in the African context (Watu)

11:30 Pause

12:00 Lecture: Changing innovation dynamics and relevance to the African context (Watu)

13:00 Lunch break

13:30 Presentation of the project draft report

Traditional science, technology and innovation systems in the context of modern incubator research development agency (Deborah Wendiro)

15:30 Scenario 1: Innovation systems in the African context

The case of national Health innovation systems (All - Group work)

16:30 Scenario 2: Application on the innovation systems framework to case studies  
The cassava case in Soroti District (All)

17:00 Adjourn

### **November 8, 2011**

09:00 Methodological approach to innovation systems research (Watu)

11:00 Case study 1  
Bark cloth production in Kamuli district (Christine Mwanja)

11:30 Case study 2  
Traditional medicine in Kamuli district (Margaret Dhabangi)

12:00 Case study 3  
Cassava production in Arua district (Deborah Wendiwo)

12:30 Case study 4  
Mushroom production in Kabale district (Deborah on behalf of Janeffer Mayambala)

13:00 Lunch break

13:30 Discussion of report – framing, scoping, approach, structure (Deborah and Watu)

16:00 Adjourn

### **November 9, 2011**

09:00 Development of report chapters (Deborah and Watu)

12:00 Lunch break

13:00 Seminar: Key research principles – Action Research (Timothy Esemu)

14:30 Development of template for case studies' analysis and write-up (All)

16:30 Adjourn

### **November 10, 2011**

10:00 General skills on report writing – abstract, introduction, methodology... (Watu)

11:00 Future prospects: IDRC prospectus, conferences, research networks, publications,  
proposal writing (Watu)

12:00 Report write-up (All - Deborah)

13:30 Lunch break

- 14:00 Analysis and write-up structure: case study 1  
Bark cloth production in Kamuli district (Christine Mwanja)
- 14:30 Analysis and write-up structure: case study 2  
Traditional medicine in Kamuli district (Margaret Dhabangi)
- 15:00 Analysis and write-up structure: case study 3  
Cassava production in Arua district (Deborah Wendiroti)
- 15:30 Analysis and write-up structure: case study 4  
Mushroom production in Kabale district (Deborah on behalf of Janeffer Mayambala)
- 16:00 Scenario on “problem tree”: framing of a research problem (Timothy Esemu)
- 16:30 1-2-1 Watu and Deborah
- 17:00 Adjourn

**November 11, 2011**

- 9:00 1-2-1 Watu and Christine Mwanja
- 9:30 1-2-1 Watu and Margaret Dhabangi
- 10:00 1-2-1 Watu and Janeffer Mayambala
- 10:30 Open discussion (All)
- 13:00 Adjourn (Departure Watu)

## Annex 2

Detailed notes on the rationale for the report structure and the purpose of each chapter (see for example the “Introduction” section)

# TRADITIONAL SCIENCE, TECHNOLOGY AND INNOVATION IN THE CONTEXT OF A MODERN...

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Strengthening linkages between traditional and  
modern knowledge systems for social inclusion

Deborah Wendiro\*, Margaret Dhabangi<sup>+</sup>, Janeffer Mayambala<sup>+</sup> and Christine Mwanja<sup>+</sup>

[Pick the date]

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<sup>+</sup> Margaret Dhabangi is MSC student... Microbiology at the University of Makerere

<sup>+</sup> Janeffer Mayambala is MSC student... Molecular biology at the University of Makerere

<sup>+</sup> Christine Mwanja is MSC student... Forestry... at the University of Makerere



## **ACKNOWLEDGEMENTS**

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## CHAPTER 1 : Introduction

### 1. Introduction

- a. Background which should not include general information but set the problem. It is a problem background
- b. How to cast the report
  - i. Discuss the role of traditional knowledge (provide definition) in developing countries; add some statistics regarding how people rely on it for their livelihoods
  - ii. It is something akin to literature review (quote some references and modern knowledge refer to Francisco Sagasti, Martin Bell etc). Discuss the duality of knowledge systems in developing countries. Provide definition of traditional knowledge (endogenous) and differentiate it from modern knowledge.
    - Francisco Sagasti on exogenous and endogenous knowledge systems and their disarticulation
    - Martin Bell's diagram
    - Proceed to discuss within research project context and emphasize the importance of bridging tradition and modern knowledge using approaches that target social inclusion
  - iii. Informal versus formal sector: emphasis that traditional knowledge is mainly used with the informal sector
    - Marginal groups – urban and rural then zero in on rural areas. Rural population generally marginalized groups in addition women and children are marginal.
- c. Rationale for the study
  - i. Discuss the role of knowledge (traditional and modern) in society and note the importance of converting knowledge to value for the socio-economic benefit of individuals, groups and communities. Then introduce the notion of innovation (definition and references) i.e. innovation is the conversion of knowledge to value (innovation is the commercialization i.e. availability in “market” for end-user of knowledge). Then proceed with discussion on innovation and distinguish between approaches to emphasize that innovation may be inclusive or exclusive. This study aims to explore approaches to innovation for social inclusion. Innovation for social inclusion offers developmental opportunities to societies. In the current context of many developing countries particularly in sub-Saharan Africa, the existing dichotomy between traditional and modern knowledge systems accentuates marginalization of vast population. We argue that strengthening linkages between the two knowledge systems (traditional and modern) would facilitate the social inclusion of marginalized societies that for the most part rely on traditional knowledge and derive their livelihoods within the informal sector.
  - ii. In developing linkages between traditional and modern knowledge systems we argue that it is critical to use an approach that consciously takes into account the needs/social challenges of the marginalized communities. Put differently, a demand-driven approach to integrating traditional and modern knowledge for social inclusion is key. This bottom up approach takes into consideration the importance of providing relevant solutions to local problems. So far attempts have been top down and this approach has not

worked. The approach assumed in this study posits a collaborative stance to investigate what local people and establishing a meeting point to respond to local challenges by integrating traditional and modern knowledge in a demand driven manner. The bottom-up approach is aimed at understanding, augmenting and enhancing solution already available. (This is an approach not a model). In light of demand driven innovation there is need to

- The relevance of the bottom up approach in bridging the gap can successfully solve local challenges.
- iii. Explain the approach
- Innovation systems perspective provides a useful way of understanding how traditional and modern knowledge can be integrated to meaningfully address social inclusion of marginalized population. Briefly explain the concept of innovation systems.
  - We use case studies to provide a framework for understanding the dynamics and mechanism for drawing on traditional and modern knowledge systems in meaningful ways that lead to social inclusion.
- d. State main objectives followed by specific objectives...This study aims to shade light on how to integrate traditional and modern knowledge for the benefit of marginalized communities. We seek to address the question: “How does...?” (We shall need to rephrase the key research issues and also avoid use of the term Innovation but stick to traditional knowledge systems)

The objectives of this study are:

- i. To provide an understanding on the mechanism of innovation in traditional knowledge systems
  - ii. To determine...
- e. This report is organized as follows: The next chapter (two) provides an overview of the context i.e. background information on
- Macro-level on human development indicators such health, education, proportion of urban to rural, inequality etc.
  - Review of government documents such as vision 2020, the National STI policy, Industrial policy etc. to identify policies promoting STI for development, which takes into account marginalized population e.g. women and children, rural areas etc
  - Justification of selected districts i.e. provide brief profiles of Kamuli, Kabale and Arua (where possible provide statistics such as morbidity and mortality (children and women); illiteracy rates vis a vis Uganda

Chapter three discusses innovation systems perspective

- how it relates to traditional and modern knowledge systems and
- how it will help address issues; then develop a framework for analysis.

Chapter four presents the methodology. A case study approach is used, (describe what was done which includes: sampling; tools for data collection; background information.

- Describe the approach used to identify the case studies:-, key informant interviews; state who was involved (put organizational structure in annex)

including how many etc for each district. Be sure to always use the terms as used in mainstream literature by authorities in the sector.

- why we looked at herbal medicine, bark cloth production, cassava production, mushroom production
- Methods for data collection on the four case studies: focus group discussions; “community champions” etc. Be sure to always use the terms as used in mainstream literature by authorities in the sector. Do not state as if it is a particular person but as if it is the community that does what is being described.

Notes: Each time justify why paragraphs are written e.g.

1. What is the basis for selecting case studies (selection criteria for case studies)?

The investigation is mainly concerned with which traditional knowledge is being used to resolve major social problems. It is important to give background dynamics regarding actual selection e.g., the local government structure and central government structure; how key informants were identified etc...

How were members of the Focus group selected? Elements looked at include general profile of community, main actors, main interactions. The reason for having key informants was to draw in depth information.

2. Case study analysis; discuss elements to be teased out

Chapter five presents the case study results and discusses them based on the elements:- organizations; innovations; and linkages and demonstrates how the approach is contributing to innovation for social inclusive (development). This could be in terms of filtering out scientific principles to highlight strengths and or identify need for combining tradition and modern knowledge.

Chapter six summarizes results and discusses implications of the case studies and the approach used (bottom-up i.e. demand driven is resolving local challenges).

- Summary of results
  - This research provides an understanding of ... in a ... context
  - The key question that was addressed .... The main findings of the research were...
- Implications:-
  - Further research
    - how far this research has advanced knowledge... never the less the research is bounded in various ways
    - Limitations
- Policy implications – despite the exploratory and bounded nature of this research ... helps shade light on a number of issues

- current policy could be thrown out replacing it with bottom up approach as it enhances understanding demand for knowledge
- Gender related policies
- Education policy
- STI policy
- Environmental policies e.g., in case of case of bark cloth
- Other forms of incentives

Annex other issues:-such as how the MSc. students were integrated and implications of this.

## CHAPTER 2 : **Overview of the context**

[Brief chapter introduction – similar to an abstract but relating to the specific chapter]

### 2.1 **Background**

[Add text here]

### 2.2 **Review of policy documents on innovation for development**

[Add text here]

### 2.3 **Selected regions for...**

[Add text here]

## CHAPTER 3 : **Bridging traditional and modern knowledge systems**

[Brief chapter introduction – similar to an abstract but relating to the specific chapter]

### 3.1 **Knowledge systems in Uganda**

[Add text here]

### 3.2 **Innovation systems approach to integrating knowledge systems**

[Add text here]

## CHAPTER 4 : **Methodology**

[Brief chapter introduction – similar to an abstract but relating to the specific chapter... A case study approach was used to... In the three identified districts, three case studies were selected based on...]

### 4.1 **Sampling**

#### 4.1.1 **Methods and tools for identifying case studies**

[Add text here]

### 4.2 **Case study tools for data collection**

#### 4.2.1 **Methods and tools for collecting data on case studies**

[Add text here]

## CHAPTER 5 : Findings and Discussion

[Brief chapter introduction – similar to an abstract but relating to the specific chapter]

### 5.1 Case study presentation ...

[Add text here]

#### 5.1.1 Case study 1: Bark cloth production in Kamuli district

[Add text here based on case study write-up template]

#### 5.1.2 Case study 2: Herbal medicine in Kamuli district

[Add text here based on case study write-up template]

#### 5.1.3 Case study 3: Cassava production in Arua district

[Add text here based on case study write-up template]

#### 5.1.4 Case study 4: Mushroom production in Kabale district

[Add text here based on case study write-up template]

### 5.2 Discussion ...

[Add text here i.e. discussion on innovation including aspects such as the importance of a demand driven approach to innovation for social inclusion, insight obtain on integrating traditional and modern knowledge systems, actors, linkages, institutions etc. base on an overall perspective of the four case studies]

## CHAPTER 6 : **Conclusion**

[Brief chapter introduction – similar to an abstract but relating to the specific chapter]

### 6.1 **Summary of results**

- This research provides an understanding of ... in a ... context
- The key question that was addressed .... The main findings of the research were...

### 6.2 **Implications**

#### 6.2.1 **Further research**

[Add text here]

#### 6.2.2 **Policy implications**

[Add text here]

# References

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[Add text here]

# Appendix A:

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[Add text here]

## Appendix B:

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[Add text here]

# Appendix C:

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[Add text here]

## Annex 3

### Case study write-up template

1. Background
  - a. Situation analysis – historical perspectives and changes
  - b. Leave the reader anxious to know what the response is.
2. Problem – solution
  - a. What is the existing negative state (e.g. in the Soroti case: farmers were faced with the problems of finding an alternative source of income as well as food crop for all year round supply)
  - b. What was the response to the problem states in a.? (e.g. in the Soroti case: the farmers’ answer to the cassava virus was to substitute sweet potato for cassava)
3. Justification of case – attach to the gender aspect (social inclusion of marginalized groups)
4. Context
5. Discussion
  - a. Environmental factors
  - b. Economic factors
  - c. Social factors e.g. gender, community organization and relationships etc
  - d. Agriculture – cropping systems
  - e. Health
6. Analysis of innovation in the case study i.e. from the innovation systems framework approach

Note: Integrate the scientific input of modern knowledge into the innovative activity of the case study within the write-up of this section. It should be brief, in layman language and well integrated within the main storyline of the write-up. Extensive details on the science behind the modern knowledge to be contained in a text box. It should provide all relevant scientific details.

For example, in the case of bark cloth e.g. after finding a niche for integrating modern knowledge and traditional knowledge to enhance the socio-economic benefits of the community, Christine decides to do her laboratory experiments on enzymes and how they can enhance the qualities of the bark cloth – See text box for science details

### Characterisation of innovation in the case studies template

	Bark cloth production	Herbal medicine	Cassava production	Mushroom production
Context/background				
Actors				
Linkages				
Types of innovation				
Triggers for innovation				
Supportive factors (framework condition)				
Impacts				
Outcome				

## Annex 4

“We wish to mainstream traditional (indigenous STI) into the incubator R&D agency. The main aspects of this process is to implement the integrated innovation systems model as in the report, hence I would like to be able to continue with the mentoring program or what I called the case study in the report which of course requires money, as it is based on the model as detailed in the report; develop curricula at several levels-at indigenous innovator level if that can be called a curriculum how can we develop a program to train, provide targeted business development services taking gender perspectives in mind-provide research and product development/improvement services? would it be paid for? what are the modalities? At primary school level how do we decodify the pedagogy of indigenous STI and then mainstream it into local schools so that children learnt STI within their environments' social, cultural economic and political milieu? Could we do a case study also? Secondary level-may be later? At University level since we have had a chance to study (it has been a small case) what are prospects for curriculum development? how do we establish linkages? Then at UIRI level-the incubator R&D agency how do we package and share our skills developed in this study and then institutionalize the model? Also important is how do we strengthen the process of forming technology platforms of innovation clinics which we did use in this study? I would invite imprompt meetings with staff of different professions to brainstorm critical issues and develop technologies. I also wish to disseminate the information and publish; write policy briefs, advocacy? Look at what networking and collaborative arrangements. I think through that process we shall be able to promote STI for development.”